PVP 20

Code: 20IT3601

III B.Tech - II Semester – Regular Examinations – JUNE 2023

MACHINE LEARNING TECHNIQUES
(INFORMATION TECHNOLOGY)

Duration: 3 hours   Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.

2. All parts of Question must be answered in one place.

BL – Blooms Level   CO – Course Outcome

			BL	CO	Max. Marks
UNIT-I					
1	a)	Assume a dataset D={(x1,y1),(x2,y2),…,(xn,yn)}, where each xi is a d-dimensional input or feature vector, and yi the corresponding output or label. Assume, these data points are drawn from some unknown distribution P, so, (xi,yi) ~ P. Identify the suitable learning methodology in this scenario. Justify with an example.	L3	CO2	7 M
	b)	Summarize the reinforcement learning with an example	L2	CO1	7 M
OR					
2	Specify the learning task for "A checkers learning problem" Illustrate the following with respect to the above problem.		L3	CO2	14 M

	(i) Choosing the training experience (ii) Choosing the target function (iii)Choosing a function approximation algorithm			

UNIT-II

3	The following table gives dataset about stolen vehicles. Using Naïve bayes classifier classify the new sample (Red, SUV, Domestic)	L3	CO3	14 M

Color	Type	Origin	Stolen
Red	Sports	Domestic	Yes
Red	Sports	Domestic	No
Red	Sports	Domestic	Yes
Yellow	Sports	Domestic	No
Yellow	Sports	Imported	Yes
Yellow	SUV	Imported	No
Yellow	SUV	Imported	Yes
Yellow	SUV	Domestic	No
Red	SUV	Imported	No
Red	Sports	Imported	Yes

OR

4	a)	Slove the precision, recall, and accuracy for the following case in the dataset. True Positive = 30 True Negative = 20 False Positive = 10 False Negative = 15	L3	CO3	7 M
	b)	Illustrate the KNN with an example.	L3	CO2	7 M

UNIT-III

5		Explain expectation maximization algorithm and when we need to use it? Illustrate with an example.	L3	CO2	14 M
		OR			
6	a)	Is supervised learning commonly carried out after clustering? If "yes" then justify your answer. And also justify your answer in "No" case.	L3	CO3	7 M
	b)	Illustrate the Voting methodology that is used for combine multiple classifiers with an example.	L3	CO2	7 M

UNIT-IV

7		Illustrate an algorithm for back propagation algorithm which uses stochastic gradient descent method. Comment on the effect of adding momentum to the network	L3	CO3	14 M
		OR			
8	a)	Explain the recurrent neural network with simple architectures.	L2	CO1	7 M
	b)	The number of hidden units is less than the number of inputs for a multilayer perceptron for classification problem. Your task is to suggest and outline the different approaches to reproduce the same number of inputs at the output layer.	L3	CO3	7 M

			UNIT-V			

9		Explain the following:
		    (i) Exploration Strategies
		    (ii) Deterministic Rewards and Actions
		    (iii) Nondeterministic Rewards and Actions
		    (iv) Eligibility Traces
			L4	CO4	14 M

		OR			
10	a)	Explain about "Single State Case: K-Armed Bandit".	L4	CO4	7 M
	b)	Compare and contrast the value Iteration and Policy Iteration in Model Based Learning.	L4	CO4	7 M